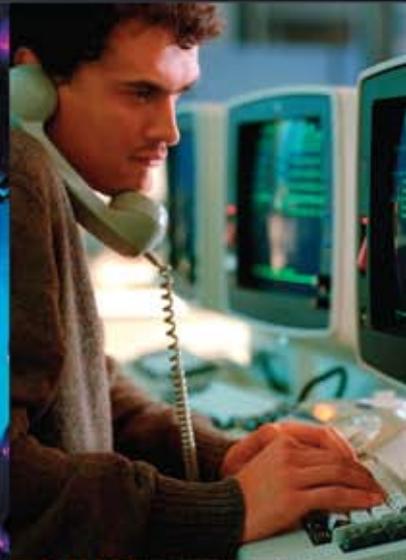
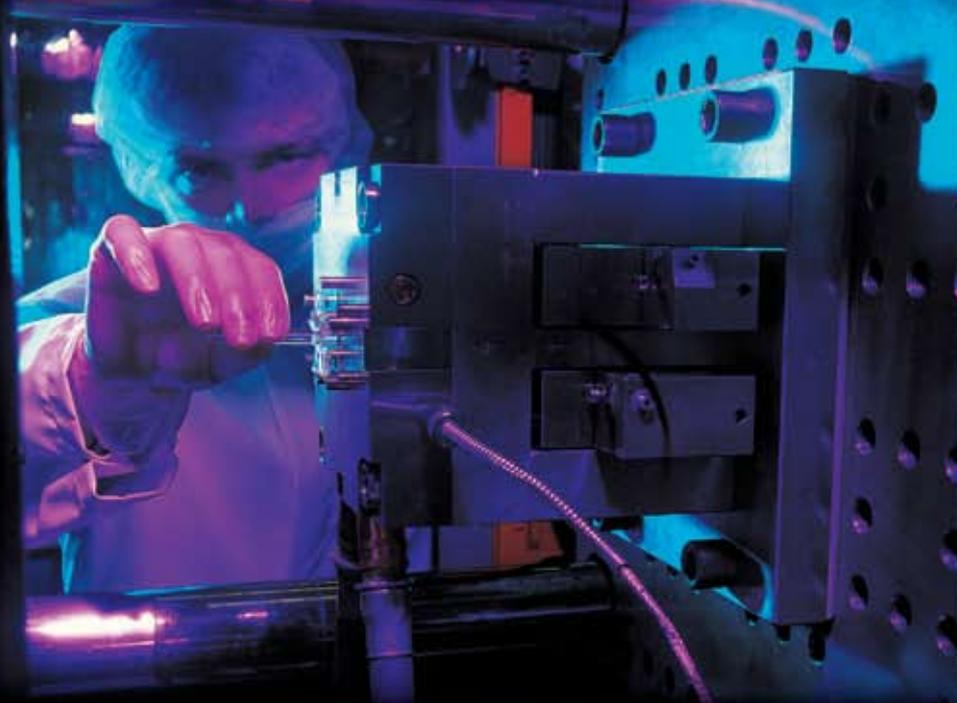




**PI** ■ ■ ■  
INTERNATIONAL

Share our **VISION**  
for **MANUFACTURING**



Automation enabled. It's all about results.



**PROFI**<sup>®</sup>  
INDUSTRIAL ETHERNET  
**NET**



**PROFI**<sup>®</sup>  
PROCESS FIELD BUS  
**BUS**

# Achieving RESULTS . . . ACROSS THE ENTERPRISE



Both Process and Discrete Manufacturing enterprises have to stay competitive in today's global marketplace. That means automating as many production processes as possible, and linking them effectively to IT management systems so that timely and useful data reaches the right places fast, letting managers make the decisions that lead to 'results'.

Since 1989, PI (PROFIBUS & PROFINET International) has been supporting that vision with the best automation technology available.

**Our mission:** to deliver maximum business advantage.

Our organization is the most effective in the world, and our technologies are backed globally by all major automation vendors. Our solutions can help your plant meet and exceed its targets.

Our twin networking protocols PROFIBUS & PROFINET are world class technologies, designed to support the most demanding manufacturing environments, and deliver real business benefits.

Share our vision for manufacturing and realize your goals for the future.

# ENABLING the VISION



## The Challenges

Manufacturing companies face daily challenges: How can I be more competitive? How can I make more products, faster? How can I be more responsive to customers needs? How can I be more profitable? How can I maintain product excellence? How can I bring more prosperity to everyone involved?

The drive for sustainable, greener manufacturing and an awareness of the impact of manufacturing on the planet - add to the burden. Regulatory issues magnify the challenges. And, all the while, the skills shortage grows.

There's only one way to operate successfully in this tough business environment and that is to use the best automation possible.

## The Solutions

As the world's premier networking protocols PROFIBUS & PROFINET support communications excellence, keeping plant floor controllers, supervisory systems and management computers operating efficiently.

Fast, effective communications plant-wide allow business units to always work in harmony. IO-LINK, a next-generation communications solution for advanced sensors and actuators, improves control and ensures accurate plant-floor data is delivered quickly.

PROFINET & PROFIBUS add new functionality to help production lines operate more effectively – such as safety and wireless connectivity.

Our determination to support International Cooperation in related fields and our dedication to International Standardization means we have a major influence on what happens globally in automation.

PI automation solutions offer choice combined with advanced technology, with only one goal in mind – to deliver the best business results, enterprise-wide.



## WHAT RESULTS MEAN FOR...

### Plant Managers:

- Lower Costs
- Faster Production
- Better Quality
- Greener Manufacturing
- Safer Plants
- Greater Responsiveness
- More Flexible Production
- Precise Regulatory Compliance
- Lower Life Cycle Costs
- Better Security
- Increased ROI

### Engineering Staff:

- Less Wiring
- Less Hardware
- Huge Vendor Choice
- Faster Engineering
- Easier Commissioning
- Simple, Accurate Documentation
- Quicker Builds
- Modular And Flexible Solutions
- Wireless Operations
- Safety Embedded

### Operations Staff:

- Transparency Down To The Sensor
- Better Maintenance
- Improved Asset Management
- Fewer Breakdowns
- Shorter Downtimes
- Easier Changes
- More Flexible Production

### Plants:

- Advanced Technology
- Easy Migration
- New Technical Solutions
- Easier Revamps
- Less Expensive Upgrades
- Longer Useful Life

### And You:

- Stay Up To Date
- Be Ahead
- Make Wise Decisions
- Improve Promotion Prospects
- Gain Better Salary
- Achieve Greater Job Security
- Increase Your Prosperity

# The PROFIBUS and PROFINET VISION



## PROFIBUS

The world's most popular fieldbus has more than 25 million installed devices, making it the most successful fieldbus in history. Its coverage of automation domains across factory, discrete and process applications makes it ideal for use in all industries.

## PROFINET

The all-encompassing Industrial Ethernet solution has many features in common with PROFIBUS. Its 'real time' solutions make it perfect for modern applications – including advanced Motion Control - while its ability to integrate with higher level networks makes it perfect for bringing plant floors into harmony with enterprise-wide IT systems. That means MES and ERP systems communicate better with the plant locations doing the work.

PROFINET & PROFIBUS play well together, with many 'added values'. PROFINET can integrate PROFIBUS networks easily; it can integrate other fieldbuses too. PROFINET is thus an ideal way to evolve plants into an Ethernet-based future, without making existing equipment and skills redundant.

PROFINET leverages the technologies and scope of the World Wide Web to keep managers better informed and plants easier to manage. PROFINET is fully-Ethernet compatible so it delivers 'convergence' for enterprise systems and the end devices that underpin modern automation.

Both PROFIBUS & PROFINET support realtime performance. Further, PROFINET offers unprecedented performance opportunities in Motion Control.

The modularity of PROFINET means not everything has to be used at once, so there is strong evolutionary energy. Additional devices and new functionality can be added easily to meet the advancing needs of plants and enterprises. Migratory options mean that PROFIBUS devices can be used today, with the assurance that they will fit in with a PROFINET system later. Other networks can just as easily be integrated.

# Our RESULTS glossary



**Automation:** the use of automated systems to manage discrete and process manufacturing units.

**Diagnostics:** applications that allow network malfunctions to be fixed quickly. In the case of PROFIBUS & PROFINET they provide the backbone for asset management and enable cost savings by reducing downtime.

**Digital Communications:** modern measurement instruments and systems are all digital, which means better, more accurate and more reliable results. PROFIBUS & PROFINET are digital communications systems, able to transmit these digital signals easily and speedily between measurement and control devices.

**Engineering Tools:** use of different engineering solutions optimized for the application. EDD, FDT, GSD, TCI are available for PROFIBUS & PROFINET.

**Ethernet:** ubiquitous communications medium (a cable really!) that drives IT departments and offices throughout the world. Together with 'TCP/IP' it underpins the world's communications. PROFINET is an 'Industrial Ethernet' designed for plant floor use.

**Fieldbus:** an automation 'enabler' for connecting control devices and systems without needing to wire everything separately. That means faster, better, cheaper installation and commissioning. It also lets devices 'talk' digitally across a single cable.

**Hazardous Area:** environment with explosion risk. Protection enables unlimited use in chemical industries.

**Industrial Ethernet:** industrialized version of Ethernet. All companies use Ethernet in their offices so it makes sense to introduce it into industrial environments. PROFINET is PI's solution. Because PROFINET draws on the PROFIBUS experience, it is the most advanced Industrial Ethernet solution you'll find.

**IO-LINK:** a sensor/actuator level communications system.

**Life Cycle Costs:** the real costs of an installation over its lifetime, taking into account all sources of expense. PROFIBUS & PROFINET make monitoring these costs easier, giving managers the information they need to make good and timely decisions about their assets.

**Migration:** the ability to move to newer technologies, enabling users to gain increased business benefits. PROFIBUS gives users easy access to the digital revolution in plants. PROFINET easily embraces PROFIBUS systems (and other fieldbuses too) and has many engineering features in common, so it allows easy migration into the Ethernet-based future.

**Motion Control:** most production lines involve the movement of products or machinery. Increasingly, 'movement' is controlled over the communications network. PROFINET & PROFIBUS both deliver advanced and innovative solutions to the precision control needed today, with a high degree of engineering commonality.

**Networked Safety:** combining control and safety systems on the same communications network makes economic sense. PROFINET & PROFIBUS deliver the same safety solution with a high level of engineering commonality.

**PI:** the global organization responsible for PROFINET & PROFIBUS.

**PROFIBUS:** the world's most widely used fieldbus.

**PROFINET:** the all-encompassing Industrial Ethernet, able to embrace fieldbus systems like PROFIBUS, delivers advanced control functionality and connects the plant-floor to management computers.

**Real-time:** automation systems need reliable and consistent millisecond response times (or better) to work successfully. Both PROFIBUS & PROFINET deliver this.

**ROI:** return on investment. Every automation investment needs to pay for itself over time to be cost-justified. PROFIBUS & PROFINET installations pay for themselves quickly with increased communications efficiencies and reduced maintenance expenses.

**Synergy:** the close relationship between PROFIBUS & PROFINET. Many aspects of both are similar, or the same, meaning engineering skills and methods easily crossover and migration is simple.

**Security:** networked systems in automation, especially those that connect to the Internet, must be protected from interference. PROFINET has led the world in developing effective and innovative security strategies for modern plants.

**TCP/IP:** protocol used with Ethernet. By itself cannot deliver the 'real-time' performance needed by automation, but PROFINET fixes that problem!

**Wireless:** literally, not using wires to connect to devices and systems. What better way to lower installation costs and connect in those more difficult environments? PROFINET in particular offers excellent wireless connectivity.



# RESULTS achieved & proven



## AUTOMOTIVE

*"The press upgrade using PROFINET gave us a clear productivity and competitive lead."*

An automotive manufacturer needed to modernize its press line with up to date motion control components, an opportunity to use PROFINET – both in the field level and for horizontal integration – for the first time. Each automation function has its own controller and cyclic communication is implemented using PROFINET with RT (real-time). The individual CPUs are linked together using PROFINET with IRT (isochronous real-time) which ensures that all CPUs are synchronized, and that the feeders are coordinated. Horizontal integration is completely seamless. Non-PROFINET components can be easily integrated with the help of interface modules. The process is more reliable, leading to optimized efficiency, enhanced productivity, and increased output. PROFINET has given the manufacturer a clear productivity and competitive lead in the market.



## INFRASTRUCTURE

*"PROFINET delivered a commercial advantage together with considerable weight savings."*

A luxurious 52 meter sailing yacht has been fitted with a PROFINET-based ship-wide network linking key ship-board functions including the motor, the bilge pump valves, fuel and ballast tanks, fresh water tanks, the heating and cooling installations, fire alarms, battery system, the navigation lights and the deck lights. PROFINET handles the data communications between the PLCs and the I/O modules and the normal Ethernet data simultaneously, and covers everything from the dimming of the lights in the accommodation area to the hydraulic system for reefing and hoisting the sails. There's a strong emphasis on energy saving. The use of one PROFINET fiber network delivers massive cable savings and a big commercial advantage for the ship-builder, together with considerable weight savings.



## CHEMICALS

*"No other fieldbus came close to matching PROFIBUS' adaptability and cost-effectiveness."*

To meet demand for mica-based pigments, a paint manufacturer commissioned a €60 million pigment production facility. PROFIBUS was chosen because it could handle both process and discrete applications. Nearly 2,500 field devices were installed in 60 PROFIBUS sub-systems. Engineers estimated a 19 percent saving due to wiring reductions, and 36 percent on engineering. Major cost savings also resulted from the ability to 'copy and paste' the plant design among the sub-systems. Centralized diagnostics and configuration mean engineers can configure a replacement field device and locate wiring faults from either of two control rooms. Identical wiring in all parts of the plant also means shorter downtime during repairs and field devices can be 'hot-swapped'.

## STEEL

*"Delays, damage and risk all eliminated."*

A Belgium steel company needed to upgrade their coil handling cranes at a stockyard in Ghent. Existing cranes were manually operated, placing too many demands on the operators and creating personnel safety hazards. The crane is now controlled fully automatically. An MES communicates coil handling instructions to the crane wirelessly over PROFINET, while a laser scanner hung beneath the gantry monitors potentially dangerous situations for plant or personnel. This scanner can also accurately locate each coil for the pick-up tongs while simultaneously detecting any damaged or faulty coils. A failsafe PLC controls all crane movements via PROFIBUS. Gates in the fence surrounding the stockyard are monitored by a separate safety PLC, which wirelessly communicates with the crane via PROFINET when a gate is opened, stopping operations immediately. An ROI of 2 years was achieved.



## FOOD/BEVERAGE

*"Our automation system combines connectivity flexibility, with specialist administration, quality and maintenance systems including MES and ERP."*

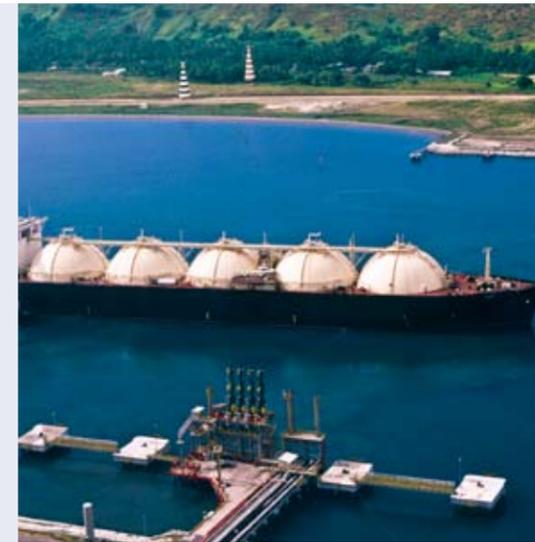
A Brazilian sugar company recently started the production of VHP (Very High Polarization) sugar, a raw material for the food industry. With an annual goal of 106,000 tons of sugar exports up to 2009, it invested R\$60 millions in the expansion of its Crushing, Steam Generation, Juice Treatment, Evaporation and Sugar plants. Engineering staff chose to use PROFIBUS for plant communications, mainly because of its high degree of acceptability and credibility, its open, interoperable communications and also its easy installation, simple configuration and architecture. The system combines connectivity and flexibility with specialist administration, quality and maintenance systems including MES (Manufacture Execution System) and ERP (Enterprise Resource Planning).



## OIL/GAS

*"The application led to better asset management using predictive maintenance."*

PROFIBUS remote systems are being used to roll out a control system for valves with electric actuators at a floating oil pier. Three docks are installed for tanker ships transporting oil and gas. In all, the system has approximately 60 valves, divided among three PROFIBUS networks. The remote systems are supplied with classified area Ex-d. protection and tropicalized electronic boards, and each is used to control the opening torque of the valves in maintenance and automatic operation, as well as for diagnostic functions. A SCADA system supervises operations and links to the remote system using Ethernet TCP/IP. The application led to better asset management using predictive maintenance due to the resources for predictive and remote parameterization offered by PROFIBUS.



# Achieving RESULTS Globally

**PI** is the largest automation organization of its kind in the world. Many different projects are currently running in more than 50 PI working groups, with the goal of delivering the best enabling technology for automation.

**PI** has 25 regional offices and 1400 member companies, and maintains more than 35 Competence Centers and more than 15 Training Centers supporting the best automation available. All major world vendors of automation technology support the PI vision.

Call one of our offices to find out how the PI network can help you realize your vision for manufacturing.

Or simply visit our web sites below.



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